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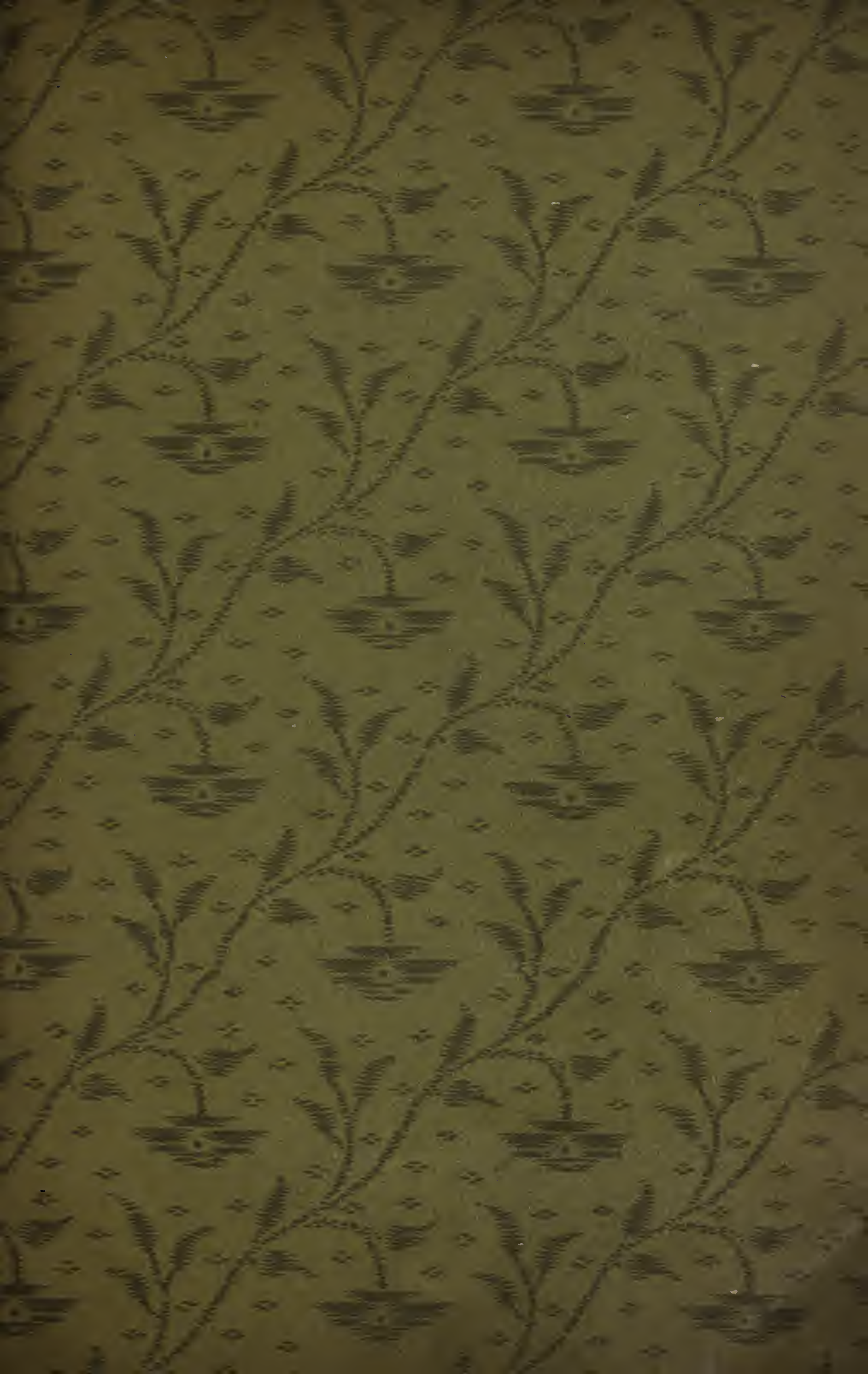

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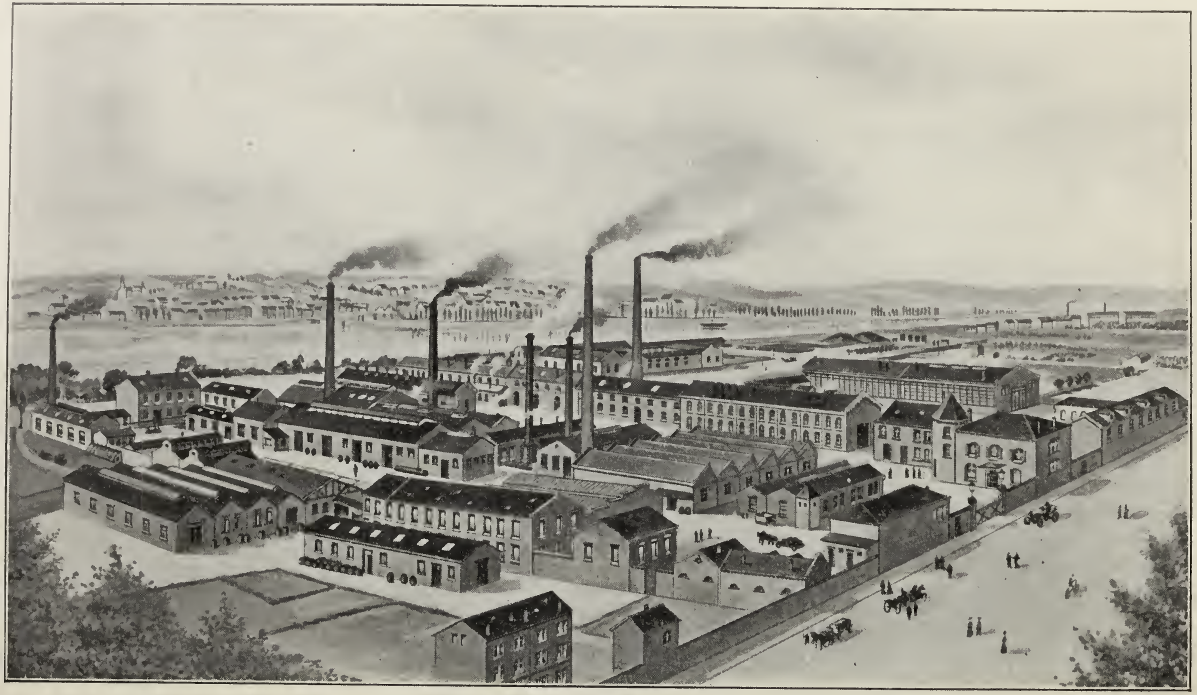

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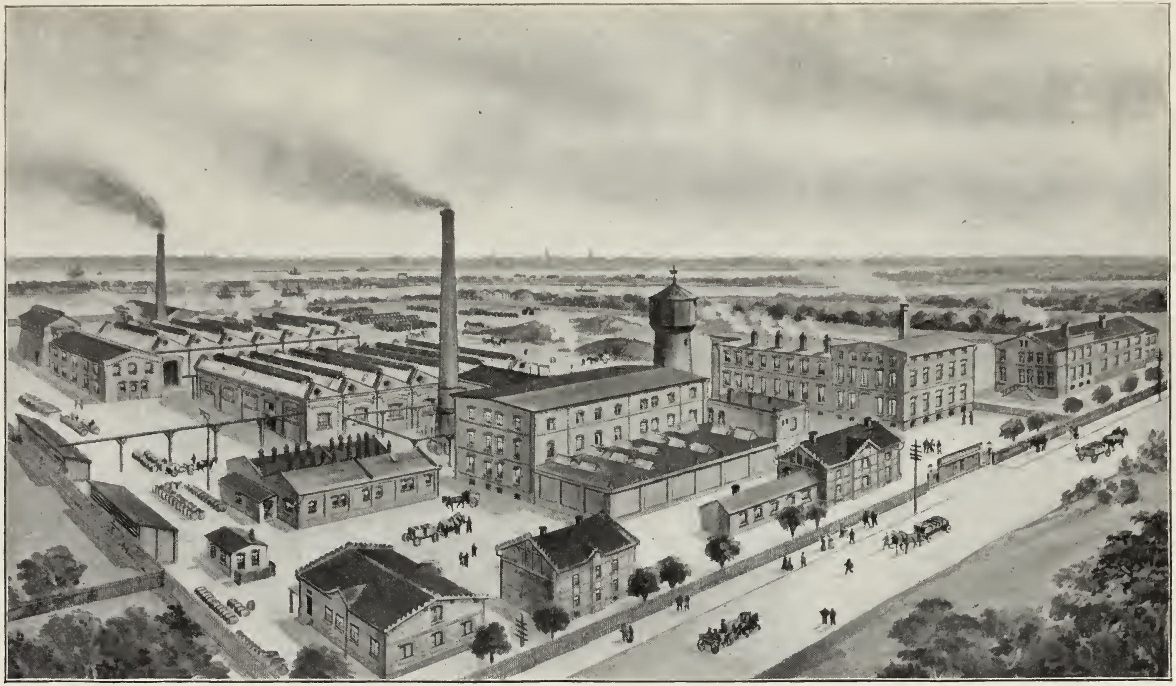

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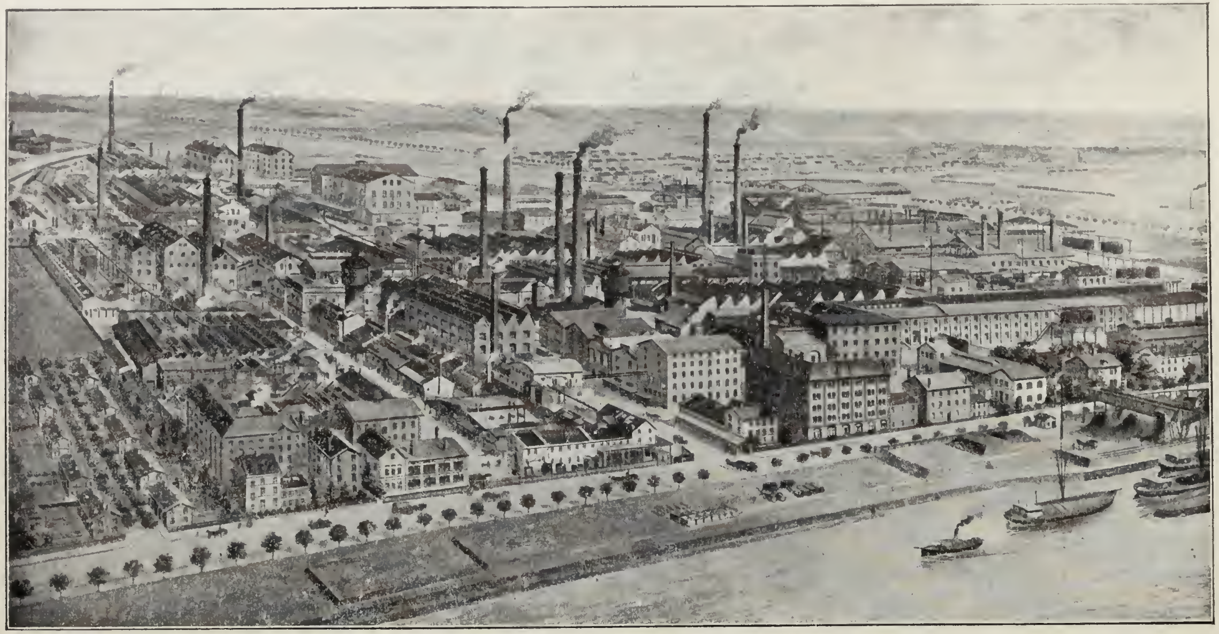

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THE DYEING OF MIXED FABRICS COMPOSED OF WOOL AND SILK

WITH THE DYESTUFFS

OF

LEOPOLD CASSELLA & Co
G. m. b. H.
FRANKFORT o. M.

⁂

AMERICAN BRANCH:
CASSELLA COLOR COMPANY
182 AND 184 FRONT STREET
NEW YORK.

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NOTE

NAPHTYLAMINE BLACK IS THE SCIENTIFIC NAME OF THE COLOR KNOWN COMMERCIALLY AS ALIZARINE BLACK.

THE LANACYL COLORS ARE KNOWN COMMERCIALLY AS ALIZARINE LANACYL COLORS.

The Dyeing
# of Mixed Fabrics composed of Wool and Silk.

Preparatory Sizing.

Preparatory Treatment for Dyeing.

In view of the great variety of wool and silk mixed goods, it is impossible to give any hard and fast rules which can be applied for every kind and in every case; the previous sizing is entirely dependent on the nature of the material, and in particular on the quality of the silk used.

Thus, fabrics of wool and tram or organzine silk are treated exactly like pure woollen materials, whereas fabrics containing silk which has not been degummed (grêge silk), such as bengaline or gloria goods, need to go through a special boiling-off process beforehand, calling for great care and experience. Such goods are often bleached also with peroxide of hydrogen or peroxide of sodium.

Under any circumstances, they must always be cleansed very thoroughly before the dyeing; impurities remaining in the material, and, above all, traces of soap, may very easily cause defective results; it is therefore very essential to use pure soft water in all the preliminary operations.

Method of Dyeing.

The dyeing is usually carried out in the same kind of vat as is ordinarily used for woollen piece-goods; bengalines are dyed in a vat with a hand winch, and only in exceptional cases is the jigger resorted to.

Wool and silk mixed fabrics may either be dyed a solid shade or in two colours or shades.

A) Solid Shades..

Solid Shades.

Solid shades are as a rule produced with Acid Colours.

We have a number of Acid Colours well suited for producing the greatest variety of tones, which dye wool and silk the same shade.

The dyeing may in certain cases also be carried out in an alkaline bath when the object is to produce very pale and clear tones.

Diamine Colours are likewise used largely for the dyeing of wool and silk mixed fabrics; they are mostly dyed in neutral baths and come more especially into consideration for dyeings which are required to be fast to water and washing. They are quite indispensable in the case of materials containing cotton (burls) in addition to the silk, cotton being always well covered by the Diamine Colours.

1. Dyeing with Acid Colours.

Acid Colours.

Strong acid baths are used for the dyeing of solid shades on wool and silk mixed fabrics, experience having shown that this method yields the most satisfactory results in dyeing both fibres the same depth of shade.

Next to the proper selection of dyestuffs suitable for dyeing solid shades, the most important point to be observed in order to obtain a uniform shade on the two fibres is a suitable regulation of the temperature of the dyebaths.

The silk is best dyed at a temperature somewhat below boiling point, at about 60° C. (140 deg. F.). The wool on the other hand is dyed to most advantage at boiling temperature; by prolonged boiling the silk is stripped again to a certain extent of the dyestuff absorbed during the first part of the operation, and in order therefore to dye the silk as far as possible the same depth of shade as the wool, the boiling should not be maintained too long, the goods being allowed to run only at, or near, boiling point. If found necessary, the silk may then be brought to shade by a suitable addition of dyestuff to the bath whilst cooling off or in a fresh cold bath as indicated on page 30.

In sampling, it is advisable to keep the wool always a little lighter in shade than the pattern so as to allow of the wool absorbing a certain amount of dyestuff during the subsequent covering of the silk which is in any case not to be prevented. The subsequent covering of the silk should as a rule be carried out in a fresh cold liquor, especially in such cases where the wool has already attained the required depth of shade, because the wool absorbs considerably more dyestuff in a hot bath than in a cold one.

For the production of deep shades, especially in the case of dyeings which are mainly produced with one dyestuff only, it is sometimes the custom to add in the first place only part of the requisite dyestuff and acid, and to dye the wool at the boil to approximately the shade of the pattern; the bath is then cooled off to about 60° C. (140 deg. F.) or lower still by adding cold water, then adding dyestuff and acid according to requirement, and working the goods until the silk also is dyed to pattern.

For compound and mode shades this method of working is on the other hand not very advantageous; in such cases the wool is dyed to pattern without regard to the shade of the silk, the silk being then covered in a fresh cold bath according to Method VIII on page 31.

The Acid Colours given below are those best suited for dyeing solid shades on wool and silk. Most of them are dyed with the addition of sulphuric acid, some also with acetic or formic acid, and a few of them in an alkaline bath.

I. Dyestuffs which are dyed with Sulphuric Acid or Bisulphate of Soda:

a) Easily levelling colours, suited in the first place for producing pale compound and mode shades:

Indian Yellow, all brands
China Yellow B
Orange extra, R
Azo Orseille BB
Rosazeïne B
Acid Violet 6BS, 6BC

Cyanole extra, FF
Thiocarmine R Powder
Tetra Cyanole V, SF, extra
Acid Green extra conc.
Fast Acid Green B, BN
Cyanole Fast Green G.

b) Dyestuffs used alone or in combination with each other for producing medium to dark shades:

Tropaeoline 00, RNP
Orange EN
Brilliant Croceïne, all brands
Croceïne AZ
Scarlet EC
Roccelline
Formyl Violet, all brands
Alkaline Violet CA, C
Brilliant Milling Green B
Formyl Blue B

Brilliant Milling Blue B
Indigo Blue N, SGN
Tetra Cyanole A
Pure soluble Blue
Water Blue B, R
Solid Blue R, 3R
Wool Blue TB
Naphtylamine Black 4B, 6B
Neutral Wool Black B, G.

Method I. Dye with the addition of

10% cryst. Glauber's salt and
10—15% bisulphate of soda

or

15—20% cryst. Glauber's salt and
4— 5% sulphuric acid.

Enter the goods at about 60°C. (140 deg. F.), raise within ½ hour to the boil, and dye for about ½ hour at boiling temperature. According to the extent to which the wool and the silk have absorbed the dyestuff at that stage, the dyeing is continued for about another ½ hour either at boiling temperature or in the cooling bath, some more dyestuff and acid being if necessary added, or the silk is covered in a fresh cold liquor as per details on page 30.

II. Dyestuffs which are dyed with Acetic Acid or Formic Acid:

Anthracite Black B, R
Gloria Black B, I, II.

Method II. Dye with the addition of

10% cryst. Glauber's salt and
10% acetic acid (30%), or the corresponding amount of formic acid;

enter at about 60°C. (140 deg. F.), raise within ½ hour to the boil, boil for ½ hour at the simmer, and run for further 30 minutes without steam.

III. Dyestuffs which are dyed in an Alkaline Bath.

Besides Alkaline Blue, there are a few other acid dyestuffs which may likewise be dyed in an alkaline bath. This method is resorted to especially for the production of very pale and pure shades on goods previously bleached with peroxide of hydrogen or peroxide of sodium, because the dyeings turn out purer than when dyed in an acid bath. The following may be dyed in an alkaline bath:

Alkaline Blue, all brands
Formyl Violet S4B
Alkaline Violet CA, C
Brilliant Milling Blue B
Rosazeïne B
Indian Yellow G, R
Orange EN
Brilliant Milling Green B

Method III.

Dye at the simmer with the addition of $1^1/_2$ to 2 lbs soap and 1—2 lbs phosphate of soda per 100 gallons liquor, Alkaline Blue with 3—5% borax, or borax and soap. The addition of 2—5 lbs Glauber's salt per 100 gallons liquor effects a better exhaustion of the dyebath.

Hard water should be corrected by boiling with some soda in order to obtain the shades as clear and bright as possible, but an excess of soda should be avoided, as the wool is then apt to assume a yellowish tinge.

The dyebaths may be preserved for further lots; in such case an addition of $^1/_5$th of the quantities of soap, phosphate of soda and borax used for the first bath is sufficient.

After dyeing, the goods are always very thoroughly rinsed, then brightened with acetic acid, and dried; dyeings produced with Alkaline Blue are given a thorough rinsing with sulphuric acid and are then developed hot.

Production of the most Current Shades with Combinations of Acid Colours.

The following enumeration of the most important combinations will be a sufficient guide for producing the various shades:

For pale compound shades (Grey and Mode)

combinations are best used of

Indian Yellow G
Azo Orseille BB
Tetra Cyanole V
Cyanole Fast Green G;

for dark compound shades (Brown and Olive)

combinations of

Indian Yellow G, FF
Tropaeoline RNP
Croceïne AZ
Roccelline
Tetra Cyanole A
Brilliant Milling Green B;

for Cream, Yellow and Orange:

China Yellow B
Indian Yellow, all brands
Orange EN, R;

for Pink:

Rosazeïne B
Irisamine G
in combination if necessary with
Acid Magenta or Erythrosine B;

for Red and Claret:

Brilliant Croceïne, all brands
Croceïne AZ
Scarlet EC
Roccelline,
for claret shades saddened with
Acid Violet 6BS
Formyl Violet S4B
Tetra Cyanole A;

for Violet:

Formyl Violet, all brands
Alkaline Violet CA, C
Acid Violet 6BS, 6BC;

for Blue:

Cyanole FF, extra (chiefly for pale blues)
Alkaline Blue, all brands
Tetra Cyanole, all brands
Brilliant Milling Blue B
Formyl Blue B;

for Navies:

Solid Blue R, 3R
Wool Blue TB
shaded if necessary with
Formyl Violet
Brilliant Milling Blue B
Brilliant Milling Green B;

for Green:

Cyanole Fast Green G
Brilliant Milling Green B
Acid Green extra conc.
  shaded with
    China Yellow B
    Indian Yellow
    Tetra Cyanole A
    Acid Violet 6BS,
  for dark green shades saddened with
    Formyl Violet S4B
    Wool Blue TB
    Orange EN;

for Blacks with a bluish cast:

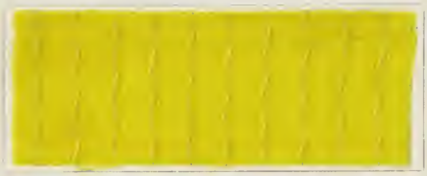
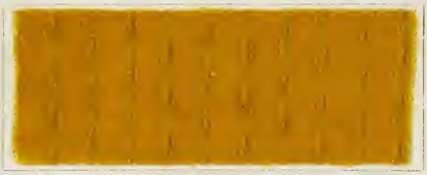
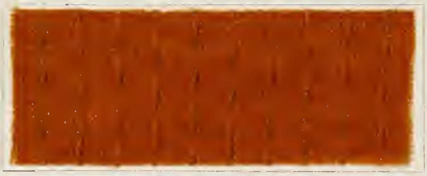
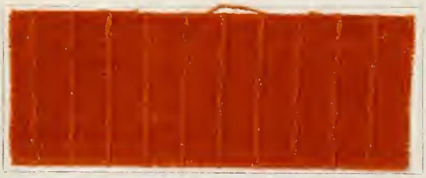
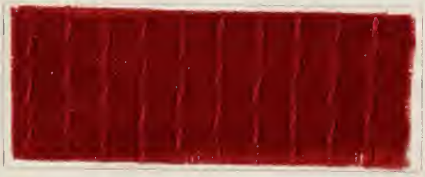
Gloria Black B
Anthracite Black B, R
Naphtylamine Black 4B, 6B
  shaded if necessary with
    Formyl Violet
    Formyl Blue B
    Brilliant Milling Green B
    Indian Yellow;

for more covered Blacks:

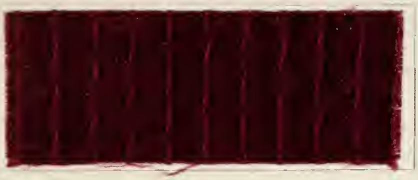
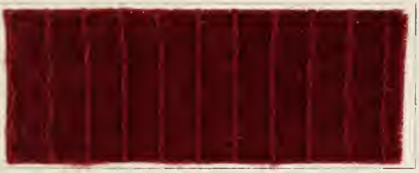
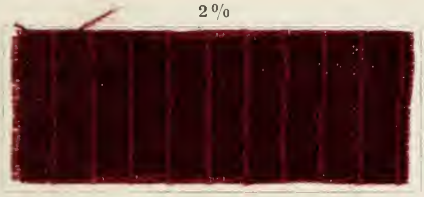
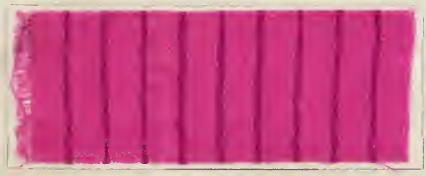
Gloria Black I, II
Neutral Wool Black B, G
  saddened if necessary with
    Indian Yellow G
    Tropaeoline RNP.

Regarding the subsequent shading of the silk in the cold bath see details on page 30.

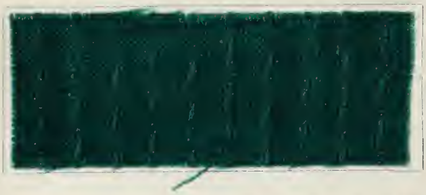
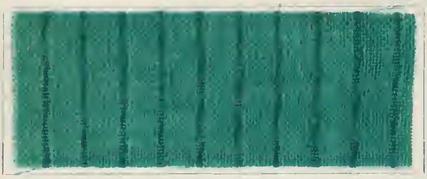
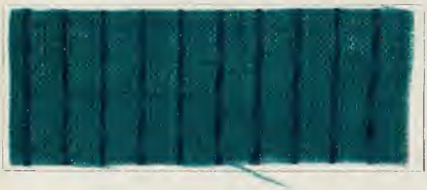
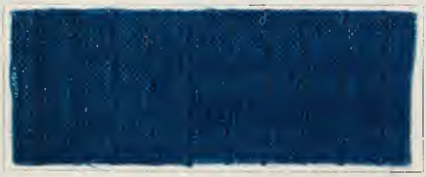
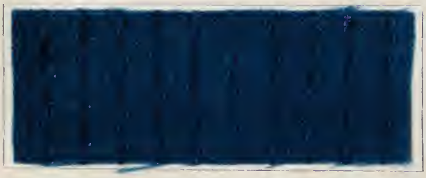
Dyestuffs for Solid Shades.

Name of the Dyestuff	Application
China Yellow B 2 % 	*Serves for the production of lemon yellows and as a shading product for bright greens.*
Indian Yellow G 2 % 	*Indian Yellow G, FF and R level very well and serve for producing yellow, brown and mode shades, as well as for saddening blacks.*
Tropaeoline RNP 2 % 	*A well covering colour for all kinds of brown shades.*
Orange EN 2 % 	*Orange EN and the redder shades "Extra" and "R" are used extensively for orange and bright browns.*
Brilliant Croceïne M 2 % 	*According to their shade, the Brilliant Croceïnes are used for the production of scarlets, reds and clarets.* *The more important brands besides "M" are the more bluish 2B, 3B, 5B, 6B and 7B brands.*

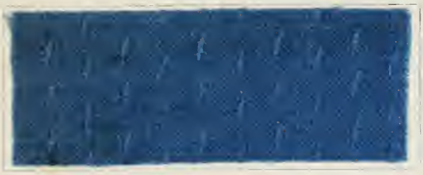
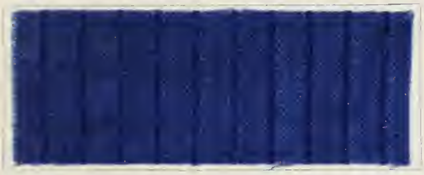
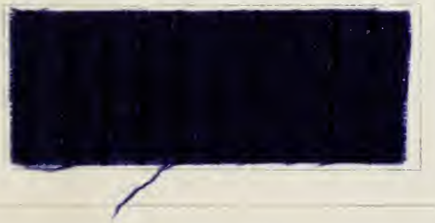
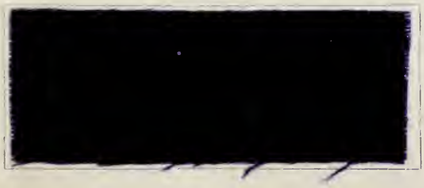
Dyestuffs for Solid Shades.

Name of the Dyestuff	Application
Croceïne AZ 2 % 	*Croceïne AZ covers the silk very well and besides for red is used as a red constituent in browns, etc.*
Scarlet EC 2 % 	*Serves for producing covered shades of red.*
Roccelline 2 % 	*Possesses great tinctorial power; is used for deep reds and claret shades.*
Azo Orseille BB 2 % 	*An excellently levelling red and used in combination with Indian Yellow G and Tetra Cyanole V for producing the greatest variety of mode shades.*
Rosazeïne B 0,5 % 	*Used for bright pinks on account of its fiery shade. It dyes the silk more strongly than the wool and is therefore shaded best with Acid Magenta.*

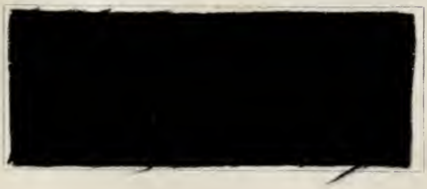
Dyestuffs for Solid Shades.

Name of the Dyestuff	Application
Cyanole Fast Green G pat. 2 % 	*Levels excellently and is fast to alkalies and light. It is used for greens and compound shades.*
Acid Green extra conc. B 2 % 	*Serves chiefly for producing bright greens.*
Brilliant Milling Green B 2 % 	*Covers the silk very well and is used for greens and as a saddening agent for olives and browns.*
Tetra Cyanole V 2 % 	*The Tetra Cyanoles cover the silk very well and are the best saddening agents for the production of compound shades of all sorts. The "A" brand is principally suited for deep shades, such as browns, olives, etc.* *Two further brands, Tetra Cyanole extra and SF, yield very bright shades and serve principally for blues.*
Tetra Cyanole A 2 % 	

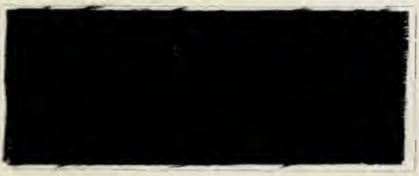
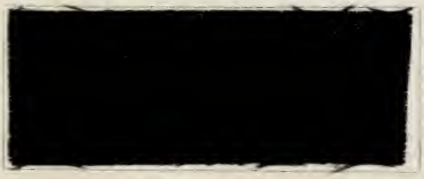
Dyestuffs for Solid Shades.

Name of the Dyestuff	Application
Cyanole FF 0,5 % 	*Serves chiefly for producing bright blues.* *The Cyanole extra yields somewhat more covered shades.*
Alkaline Blue 6B 1 % 	*Alkaline Blue 6B and the other brands 5B to 3R are used for specially clear shades of blue.*
Formyl Blue B pat. 2 % 	*These products dye silk very well and yield bright shades.* *They are useful for producing the whole range of blue and violet shades and also for brightening navy blues.* *Besides Formyl Violet S4B, the more bluish brands 6B and 10B are likewise very serviceable for the same purpose.*
Brilliant Milling Blue B pat. 2 % 	
Formyl Violet S4B pat. 2 % 	

Dyestuffs for Solid Shades.

Name of the Dyestuff	Application
Acid Violet 6BS 2 % 	*Levels very well and is chiefly used for shading purposes.* *A further brand, possessing good fastness to alkalies, is Acid Violet 6 B C.*
Solid Blue R 2 % 	*The Solid Blues dye the silk very well and are used extensively in combination with Formyl Violet for producing shades ranging from dark blues to navies.*
Solid Blue 3R 2 % 	
Naphtylamine Black 4B 6 % 	*Naphtylamine Black 4 B and the more bluish brand 6 B are used principally for ladies' dress goods.* *They yield blacks fast to rubbing with a bluish cast which may easily be saddened with Indian Yellow.*
Anthracite Black B pat. 6 % 	*Dyes a bright blue-black and by reason of its good fastness to water is used largely especially in the umbrella trade (gloria goods).* *Anthracite Black R yields somewhat more purple shades.*

Dyestuffs for Solid Shades.

Name of the Dyestuff	Application
Gloria Black B pat. 6 % 	*Besides Neutral Wool Black, the Gloria Blacks are the most important dyestuffs for the production of blacks; they cover the silk very well and in view of this property are extensively employed for the various kinds of wool and silk mixed goods.* *Gloria Black B is the bluest brand, "I" yields a more greenish and "II" a more covered black.*
Gloria Black I pat. 6 % 	
Gloria Black II pat. 6 % 	
Neutral Wool Black B pat. 6 % 	*Neutral Wool Black B and G find the same extensive application as Gloria Black, from which they differ chiefly by their more covered shade and in their property of dyeing in an acid or in a neutral bath.* *When dyed in an acid bath they leave white cotton lists a pure white.*
Neutral Wool Black G pat. 6 % 	

2. Dyeing with Diamine Colours.

Diamine Colours.

The Diamine Colours are likewise very extensively used for the production of solid shades on wool and silk mixed goods by virtue of their covering both fibres easily and uniformly and yielding dyeings of excellent fastness to water and washing. Cotton burls and other impurities contained in the goods are completely covered by the Diamine Colours.

A suitable regulation of the temperature is likewise very important in this case, as the Diamine Colours go very strongly on to the wool at boiling temperature, while dyeing the silk almost exclusively at about 60°C. (140 deg. F.).

By prolonged boiling therefore the wool is dyed chiefly, whereas by dyeing at 60°C. (140 deg. F.) and below the silk is covered and the wool hardly at all.

The Diamine Colours, especially in deep shades, do not completely exhaust; the baths are therefore to advantage preserved for further use. When dyeing subsequent lots in the standing bath, from $^{3}/_{4}$ to $^{4}/_{5}$ of the quantity of dyestuff and $^{1}/_{5}$ of the quantity of Glauber's salt used for the first bath will under ordinary circumstances prove sufficient. Hard water should be avoided as far as possible, condensed water being the best suited for dyeing.

The Diamine Colours enumerated below are used chiefly for the dyeing of wool and silk mixed goods. With the exception of the blue brands, which exhaust best with acetic acid or formic acid, they are dyed in a neutral Glauber's salt bath.

Thioflavine S
Oxy Diamine Yellow TZ
Diamine Fast Yellow FF, 3G
Diamine Yellow CP
Diamine Orange B, F
Diamine Rose BD, GD
Diamine Scarlet B, 3B
Diamine Red 5B
Diamine Fast Red F
Diamine Bordeaux S
Oxy Diamine Violet B, R
Diamineral Brown G
Diamine Catechine G
Diamine Brown 3G, R, V, M, B
Oxy Diamine Brown G, 3GN
Diamine Sky Blue FF
Diamine Blue RW
Diamine Brilliant Blue G
Diamine New Blue R, G
Oxy Diamine Blue B, R, G, 3G, 5G
Diamine Steel Blue L
Dismine Green B, G, CL
Diamine Dark Green N
Diamine Grey G
Diamine Black HW
Oxy Diamine Black
JW, JWF, JB, JEI
Oxy Diamine Black S000.

Dye with the addition of **Method IV.**

$^1/_2$—2 lbs cryst. Glauber's salt
per 10 gallons liquor
(according to the depth of shade).

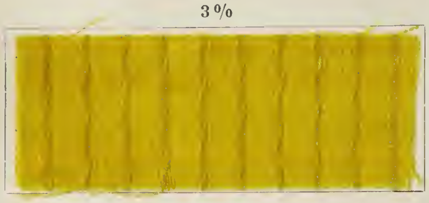
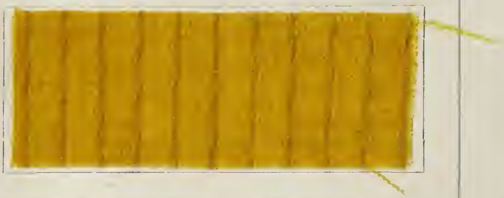
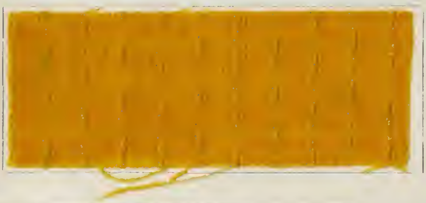
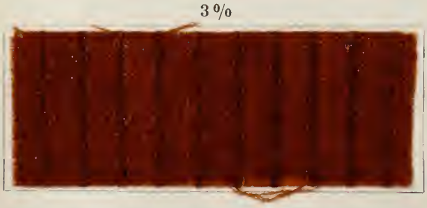
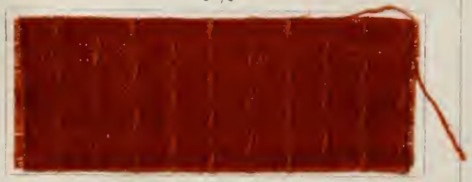
Enter the goods at about 60° C. (140 deg. F.), raise gradually to the boil, dye for about 1 hour in a boiling hot bath or at the simmer, and then rinse thoroughly.

The blue Diamine Colours are best dyed with the addition of 10% Glauber's salt and 2—4% acetic acid.

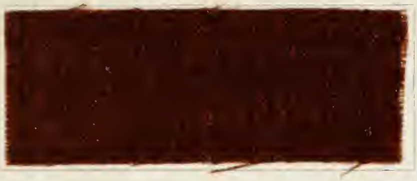
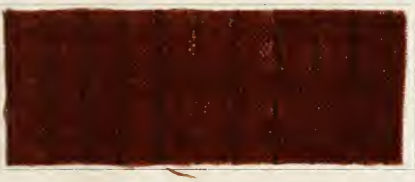
In case the silk should by then not have assumed the desired shade, it is best covered in a cold acetic acid bath as per details given on page 30.

The goods are finally brightened with acetic acid.

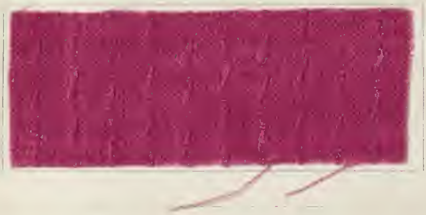
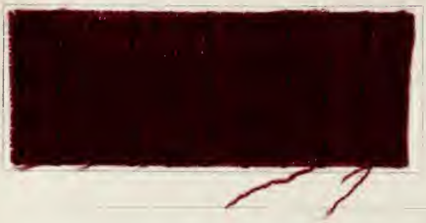
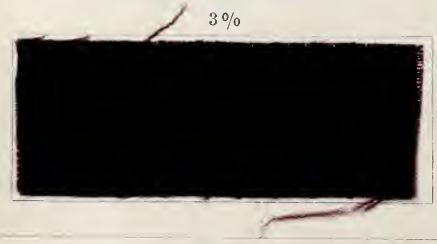
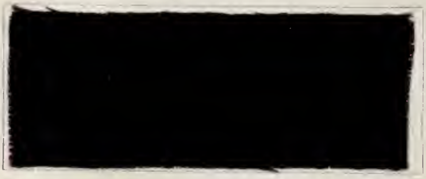
Dyestuffs for Solid Shades.

Name of the Dyestuff	Application
Thioflavine S 3 % 	*Serves for producing greenish yellow shades.*
Diamine Fast Yellow FF pat. 3 % 	*Used for greenish and more covered yellows.*
Diamine Yellow CP 3 % 	*A rich yellow for the production of yellow, brown and olive shades.*
Diamine Orange B 3 % 	*Covers silk especially well and used for orange and yellow-brown shades.*
Diamine Orange F 3 % 	*Very useful for orange shades and for shading scarlets.*

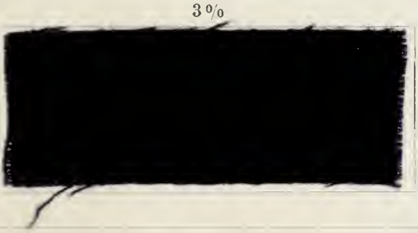
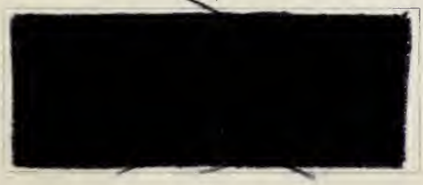
Dyestuffs for Solid Shades.

Name of the Dyestuff	Application
Diamineral Brown G pat. 3 % 	*Serves for the production of bright browns and for compound shades.*
Diamine Catechine G pat. 3 % 	*Covers the silk excellently and is used alone as well as for the shading of mode and brown shades.*
Diamine Brown 3G 3 % 	*Diamine Brown 3G, R, M, V and B serve for the production of all kinds of brown shades; the 3G, R and V brands cover the silk especially well.*
Diamine Brown R 3 % 	
Diamine Brown V 3 % 	

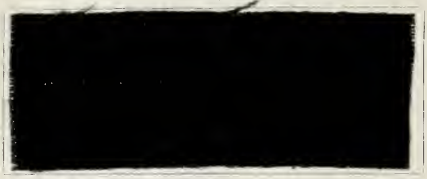
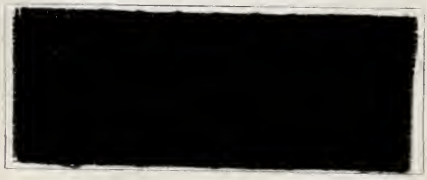
Dyestuffs for Solid Shades.

Name of the Dyestuff	Application
Diamine Rose BD pat. 0,5 % 	*Diamine Rose BD and the somewhat yellower GD are used for the dyeing of pink shades.*
Diamine Scarlet B 3 %	*Serve as well covering reds for scarlet shades.*
Diamine Scarlet 3B 3 % 	
Diamine Bordeaux S 3 % 	*Diamine Bordeaux S is very extensively used for claret shades by itself and in combination with Diamine Scarlet or Oxy Diamine Violet B.*
Oxy Diamine Violet B 3 % 	*Serves for producing dark purple shades and for saddening claret and red shades.*

Dyestuffs for Solid Shades.

Name of the Dyestuff	Application
Diamine Blue RW pat. 3 % 	*Serves for blues and navy blues.*
Oxy Diamine Blue 5G 3 % 	*The Oxy Diamine Blue brands cover silk very well and serve for the production of all kinds of blues.* *The B, G and 3G behave like R and 5G and stand between these two in shade.*
Oxy Diamine Blue R 3 % 	
Diamine New Blue R pat. 3 % 	*Diamine New Blue R and the more greenish Diamine New Blue G are used for full blues and also dye the silk very well.*
Diamine Steel Blue L pat. 3 % 	*Used for producing steel blue shades and for shading greens and olives.*

Dyestuffs for Solid Shades.

Name of the Dyestuff	Application
Diamine Green G pat. 3 % 	*Serve for the production of green and olive shades.* *In addition to the yellowish Diamine Green G and the bluest "CL" brand, Diamine Green B and the more covered Diamine Dark Green N are well suited for this purpose.*
Diamine Green CL pat. 3 % 	
Diamine Black HW pat. 3 % 	*Diamine Black HW is used for Greys and as a saddening agent.*
Oxy Diamine Black JWF pat. 6 % 	*The Oxy Diamine Black brands are used for all kinds of black shades and offer the advantage of simultaneously covering cotton very well.* *"JWF" possesses a more bluish and "JB" a more greenish shade.*
Oxy Diamine Black JB pat. 6 % 	

B) The Production of Two-coloured Effects.

Two-coloured Effects.

Two-coloured effects are produced on wool and silk mixed goods by first dyeing the wool with such Acid Colours as go almost exclusively on to the wool fibre and stain the silk as little as possible, and then dyeing the silk cold in a second bath.

If, owing to its having absorbed too much of the wool dyestuff, the silk does not appear clean enough and insufficiently clear results are consequently apt to be obtained thereon, the silk must be subjected to a special cleaning treatment as described on page 24.

1. Dyeing the Wool first in an Acid Bath.

In order to prevent the silk fibre in wool and silk mixed fabrics as much as possible from getting stained, it is essential to select most carefully the most suitable Acid Colours and to apply them according to the most approved method.

While a small amount of acid and a high temperature of the dyebath will materially assist in keeping the silk as clean as possible, a strongly acid bath or working at a temperature below the boil will cause the silk to become more or less severely stained.

In order to attain as high a temperature in the dyebath as possible, a second steam-coil may if necessary be inserted into the dye-vessel (preferably in the part in which the goods are contained).

The goods are dyed with the addition either of acetic or formic acid; the latter works out a little cheaper and exhausts the dyebath slightly better. The use of bisulphate of soda or sulphuric acid must be avoided, as these will cause the silk to become stained.

The following dyestuffs and combinations of same are best suited for dyeing the wool, and stain the silk but slightly or not at all:

For compound shades (grey, mode, brown, olive):

Combinations of

Acid Yellow AT
Naphtol Yellow S
Orange GG
Lanafuchsine SG
Azo Wool Blue C,

for slate shades also combinations produced with

Cyanole extra FF
Lanafuchsine SG, SB;

for Cream, Yellow and Orange:

Naphtol Yellow S
Acid Yellow AT
Fast Yellow S
Orange GG
Lanafuchsine SG (for shading towards red);

for Pink:

Eosine 3G, BN
Eosine Scarlet B
Lanafuchsine SG, SB
Brilliant Scarlet 4R, 6R;

for Red and Claret:

Lanafuchsine SG, SB, 6B } (especially well suited)
Brilliant Scarlet 4R }
Brilliant Scarlet 6R
Crystal Scarlet 6R
Scarlet FR, F2R, F3R
Brilliant Cochineal 2R
Naphtol Red C } (especially well suited)
Amaranth }
Acid Magenta (in pale shades);

for Violet:

Azo Wool Violet 7R,

shaded if necessary with

Azo Wool Blue C
Cyanole FF (for bright pale shades);

for Blue and Navy Blue:

Cyanole FF, extra (for pale and medium blues),

for Navy and Dark Blues shaded with

Azo Wool Blue C
Lannafuchsine 6B
Azo Wool Violet 7R
Orange GG
Acid Yellow AT;

for Green:

Acid Green extra conc. } (for bright pale tones)
Acid Green 5G }
Naphtol Green B (for dark green),

shaded if necessary with

Azo Wool Blue C
Acid Yellow AT
Orange GG;

for Black:

Naphtylamine Black EFF,

shaded if necessary with

Azo Wool Violet 7R (for bright blue-blacks)
Acid Yellow AT } for jet blacks;
Orange GG }

Method V.

Directions for Dyeing Fancy Colours (with the exception of Pink and Red which are dyed with Eosine or Eosine Scarlet).

Charge the dyebath with

10 % cryst. Glauber's salt,
8—15 % acetic acid 30 %
(according to the depth of shade required),
or
10 % cryst. Glauber's salt and
$1^{1}/_{4}$—$2^{1}/_{2}$ % formic acid 85 %
(according to the depth of shade required),

and the requisite quantity of dyestuff; enter the goods straight into the bath at the boil, and boil hard for about an hour. Then rinse well, and acidulate in the last rinsing bath with acetic or formic acid.

Method VI.

For Pink and Red produced with Eosine and Eosine Scarlet, charge the dyebath with

10 % cryst. Glauber's salt,
2—5 % acetic acid 30 %,
and the requisite quantity of dyestuff.

Enter the goods at 50—60° C. (120—140 deg. F.), raise to boiling temperature in the course of $^{1}/_{2}$ hour, boil for 30—40 minutes, rinse, and brighten as stated above.

Cleaning the Silk.

Cleaning the Silk.

The above-mentioned dyestuffs and combinations have been selected as those best adapted for leaving the silk effects perfectly unstained and clean in pale to medium shades. In the case of deep shades a slight staining of the silk is not altogether to be avoided, so that it is then necessary to submit the material to a cleaning process in order to strip the silk and thus remove any colouring matter which may have become fixed thereon.

For this purpose the pieces are taken into a fresh bath of 60—80° C. (140—175 deg. F.), previously charged with 5 to 10 oz oxalate of ammonia per 100 gallons liquor according to the hardness of the water; in this liquor they are allowed to run for 10—20 minutes until the silk is sufficiently decolourised; then they are rinsed, and brightened.

The addition of oxalate of ammonia may be omitted if very soft or condensed water be used, the silk in such case being cleaned merely with water.

A more severe stripping of the silk may if necessary be effected by adding about 1 oz acetate of ammonia*) per 10 gallons liquor; good results are likewise obtained with bran.

The wool loses only very slightly, if at all, in colour by the first-mentioned method; by the second, severer method, however, a certain amount of dyestuff is stripped off, which fact has to be taken into consideration in the dyeing.

Directions for Dyeing Black.

Method VII.

Charge the dyebath with

10 % cryst. Glauber's salt,
2 % formic acid 85 % and, say,
8 % Naphtylamine Black EFF;

enter the goods at boiling temperature, add

2 % formic acid

after 3/4 hour's boiling in several portions, and dye for another 20 or 30 minutes in the bath whilst boiling up hard. Then rinse, and clear the silk, which will be tinted a slightly bluish grey, with a solution of hydrosulphite according to the following recipe:

Prepare a bath of

2 1/2—3 gallons acetic acid 30 % and
4—5 „ solution of hydrosulphite**) per 100 lbs material

at a temperature of 50—60° C. (120—140 deg. F.), enter the

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*) Acetate of ammonia is prepared by mixing
190 parts by weight ammonia of 39° Tw. (24 %) with
500 „ „ „ acetic acid of 8° Tw. (30 %).

The solution should be neutral and not alter the colour of blue or red litmus paper to any extent.

**) Preparation of the Hydrosulphite solution.

Mix 1 gallon bisulphite of 65° Tw. with
1 „ cold water, and whilst slowly stirring add
1 lb zinc dust.

Stir for a short time, allow to settle, filter if necessary, and use the clear solution.

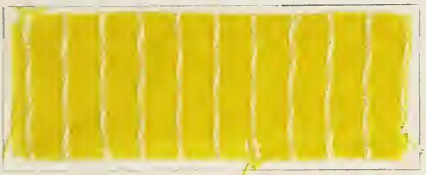
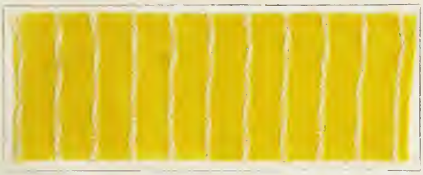
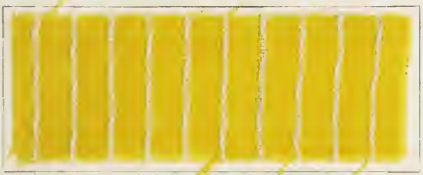
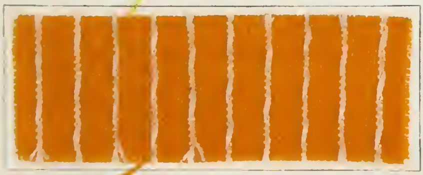
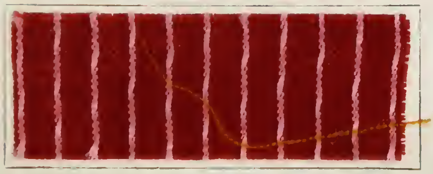
As the hydrosulphite solution decomposes rather easily, thus losing in effect, it should be prepared afresh for each case and be added to the bath a short time only before entering the goods.

goods immediately, and work for 20 or 30 minutes until the silk is sufficiently white. Then rinse very thoroughly, sour off cold with about 5% sulphuric acid (reckoned on the weight of the goods), rinse once again, and brighten finally with acetic or formic acid.

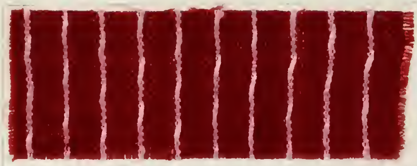
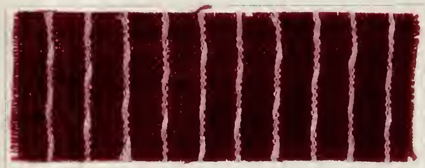
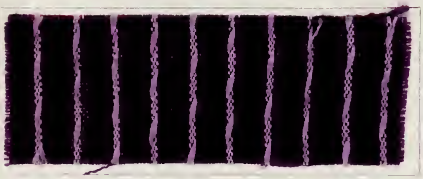
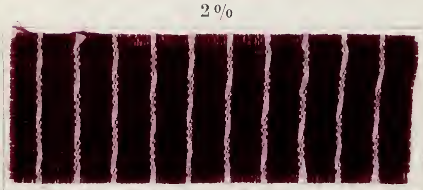
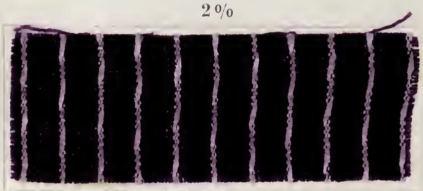
The silk may if necessary be slightly blued in the brightening bath by adding a trifling quantity of Formyl Violet, Brilliant Milling Blue or Water Blue.

During the stripping operation the goods should be exposed as little as possible to the air; they should best be covered completely by the liquor and by means of a stick be kept moving slowly to and fro.

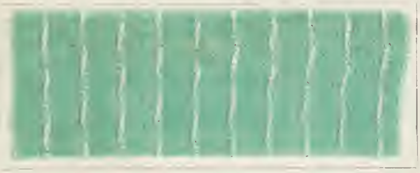
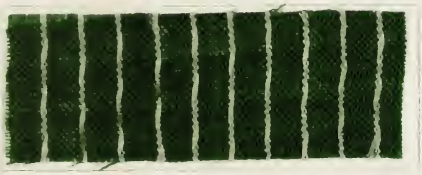
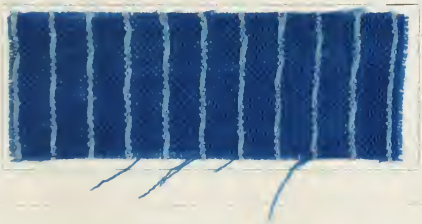
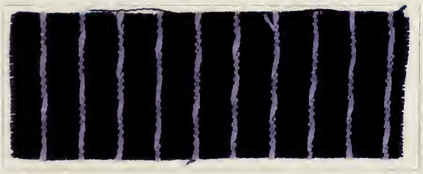
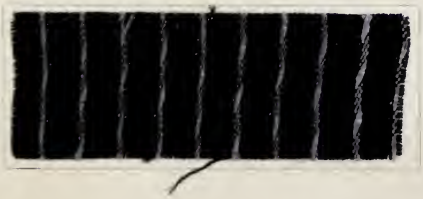
Dyestuffs for Two-coloured Effects.

Name of the Dyestuff	Application
Naphtol Yellow S 2 % 	*Naphtol Yellow S is used for producing clear greenish yellow tones, and also for shading bright greens, olives, and mode shades.*
Acid Yellow AT 2 % 	*Is used largely as a yellow constituent for mode, olive and compound shades of every description.*
Fast Yellow S 2 % 	*Used a great deal for golden yellow tones as well as for browns and olives.*
Orange GG 2 % 	*Used for orange shades and also as a shading product.*
Scarlet FR 2 % 	*Scarlet FR, F2R and F3R are used mainly for producing scarlet shades.*

Dyestuffs for Two-coloured Effects.

Name of the Dyestuff	Application
Brilliant Scarlet 4R 2 % 	*Leaves the silk particularly clean. A bluer brand is Brilliant Scarlet 6 R, which is likewise very good in this respect.*
Lanafuchsine SG 2 % 	*Used very largely for the production of red tones of every kind, and in combination with Acid Yellow AT and Azo Wool Blue C for producing a great variety of compound shades. Lanafuchsine SB is a bluer brand.*
Lanafuchsine 6B 2 % 	*Lanafuchsine 6 B is used mainly for producing bright shades of magenta.*
Naphtol Red C 2 % 	*This product leaves the silk particularly white and is used for shades ranging from full reds to clarets.*
Azo Wool Violet 7R 2 % 	*Azo Wool Violet 7 R is used for violet and claret shades and also as a shading product.*

Dyestuffs for Two-coloured Effects.

Name of the Dyestuff	Application
Acid Green extra conc. 1 % 	*Acid Green extra conc. and the more yellowish brand Acid Green 5 G are used for the production of bright greens.*
Naphtol Green B 2 % 	*Suited very well for producing covered shades of green and olive.*
Cyanole FF pat. 1 % 	*Used principally for delicate shades of blue, and, in combination with the other easily levelling colours, for producing delicate mode shades.*
Azo Wool Blue C pat. 2 % 	*Azo Wool Blue C leaves the silk a very good white and is used for producing a great variety of blue shades, as also for compound shades of every description.*
Naphtylamine Black EFF pat. 7 % 	*Of all the acid blacks, Naphtylamine Black EFF is the best in respect to leaving the silk unstained.*

Subsequent Dyeing of the Silk.

Subsequent Dyeing of the Silk.

In the case both of solid shades and of two-coloured goods the silk is dyed in a cold weakly acid bath with dyestuffs which have a strong affinity for this fibre and dye the wool as little as possible.

The dyeing of the silk is facilitated by warming the bath slightly, to about 30 – 45° C. (105 — 113 deg. F.); at such temperature the wool is however also dyed slightly.

The following Acid Colours, Diamine Colours and Basic Colours come mainly into consideration as suitable for the purpose:

a) Acid Colours:

Milling Yellow 0, 00
Tropaeoline RNP
Brilliant Croceïne M, 9B
Croceïne AZ
Milling Red FR
Azo Orseille BB
Lanafuchsine SG
Amaranth B
Acid Magenta
Rosazeïne B
Formyl Violet S4B, 10B
Acid Violet 6BS
Acid Green extra conc.
Fast Acid Green BN
Brilliant Milling Green B
Brilliant Milling Blue B
Formyl Blue B
Cyanole FF
Tetra Cyanole V, A
Water Blue B
Wool Blue TB
Naphtol Blue G
Naphtol Blue Black
Naphtylamine Black ESN.

b) Diamine Colours:

Oxy Diamine Yellow TZ
Diamine Yellow CP
Oxy Diamine Red S
Diamine Rose BD
Diamine Heliotrope B
Diamine Sky Blue FF
Diamine Blue BB.

c) Basic Colours:

Thioflavine T
Paraphosphine G
Tannin Orange R
Chrysoïdine F
Bismarck Brown GG
Safranine G extra No 0
Tannin Heliotrope
New Methylene Blue N
Solid Green.

Method VIII.

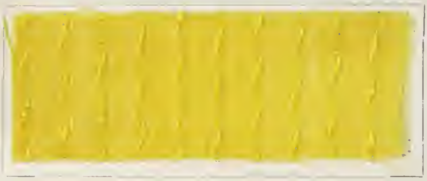
With any of the aforementioned dyestuffs the silk is dyed for $^1/_2$—1 hour in a short cold or lukewarm bath with the addition of about 5% acetic acid.

For the Acid Colours, up to 10% acetic acid may be used, according to the depth of shade required; instead of acetic acid, 2—4% sulphuric acid may be used.

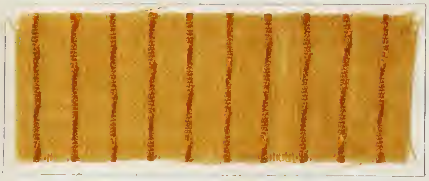
After dyeing, the goods are rinsed thoroughly, and brightened with acetic acid.

Dyestuffs for Dyeing the Silk subsequently.

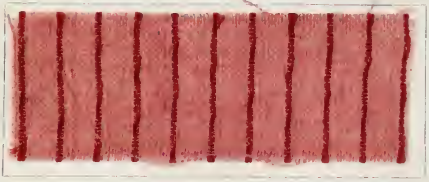
Milling Yellow O



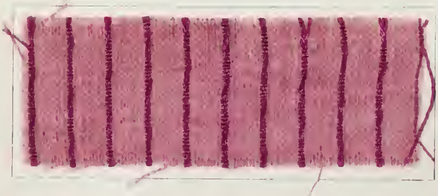
Tropaeoline RNP



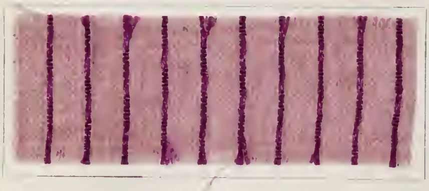
Milling Red FR



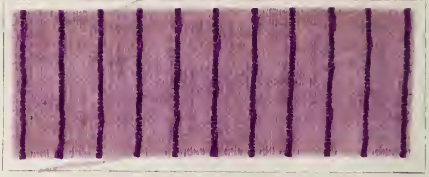
Azo Orseille BB



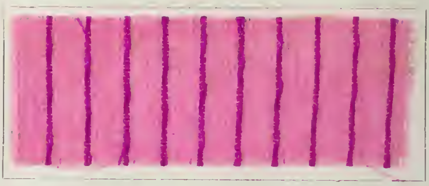
Amaranth B



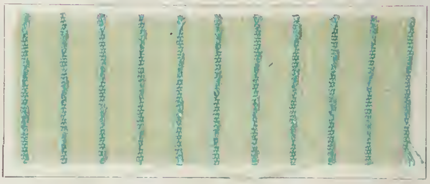
Lanafuchsine 6B



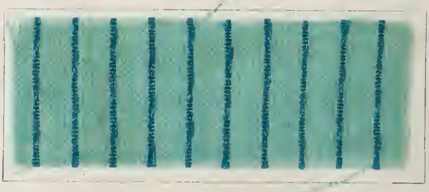
Rosazeïne B



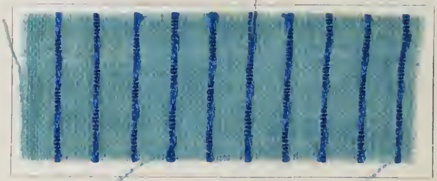
Acid Green extra conc.



Brilliant Milling Green B



Cyanole FF pat.



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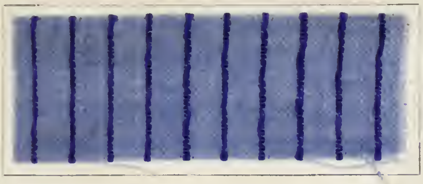
Water Blue B



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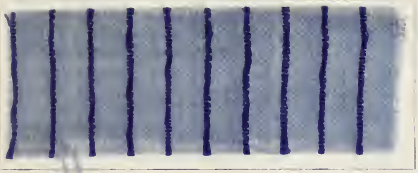
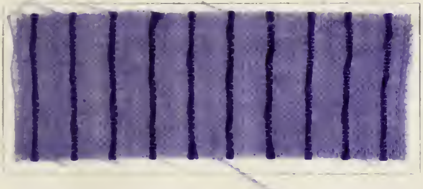
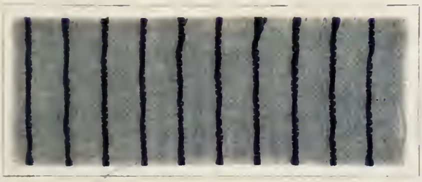


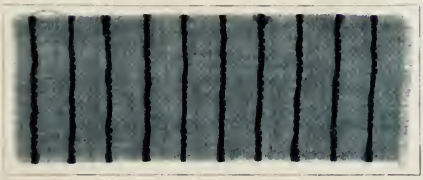
Formyl Violet S4B



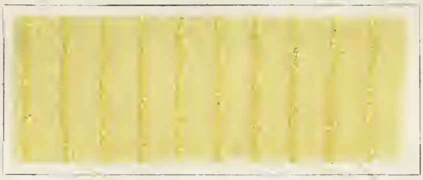
Naphtol Blue G



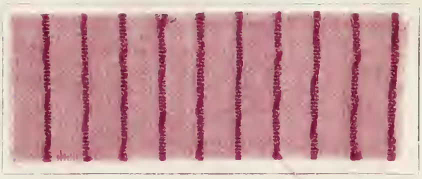
Naphtol Blue Black



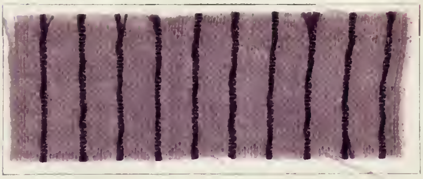
Oxy Diamine Yellow TZ



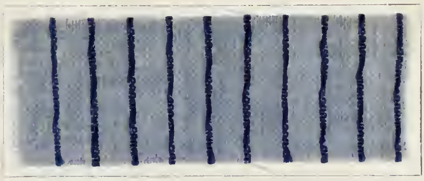
Diamine Rose BD



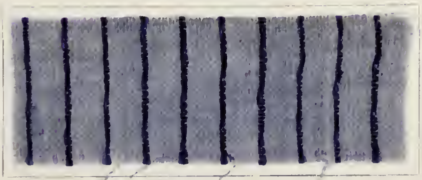
Diamine Heliotrope B



Diamine Sky Blue FF

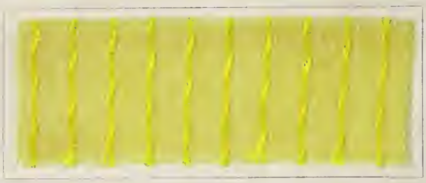


Diamine Blue 2B

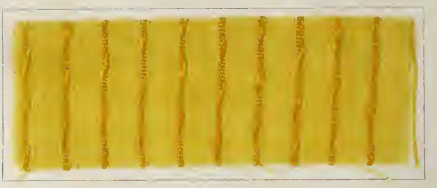


Dyestuffs for Dyeing the Silk subsequently.

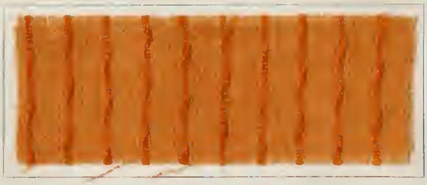
Thioflavine T



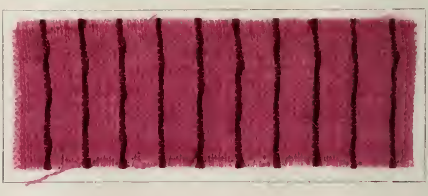
Paraphosphine G



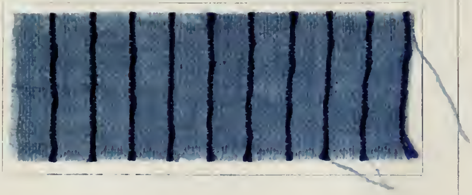
Tannin Orange R



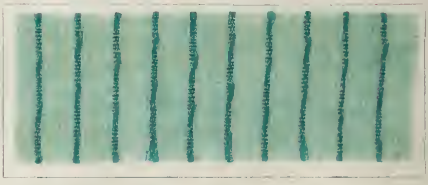
Safranine G extra 0



New Methylene Blue N



Solid Green Crystals 0



Appendix.

Dyeing of Gentlemen's Suitings containing Silk Effect Threads.

The number of dyestuffs suitable for dyeing goods of this kind is relatively small owing to the extremely high demands for fastness made of materials of this kind.

For compound shades and blacks, our Anthracene Colours are in the first place to be recommended; in addition to Anthracene Chrome Blue F for the production of navies and dark blue shades, our special brand "Dark Blue WS" comes into consideration; the latter, particularly, combines with good properties of fastness the advantages of a simple method of application and a low cost.

The following dyestuffs and combinations thereof are best suited for the dyeing of gentlemen's suitings containing silk effect threads:

For compound shades (grey, mode, brown, olive): **Compound Shades.**

Combinations of

Anthracene Yellow BN
Anthracene Chrome Violet B (as a red constituent)
Anthracene Chrome Blue F.

These are dyed to advantage on a chrome mordant, silk effects being left clearest by following this method.

Mordant the goods, according to the desired depth of shade, in the customary manner with **Method IX.**

2—3 % bichromate of potash and
$1^1/_2$—$2^1/_2$ % tartar

for 1½ hour at the boil, rinse, and dye in a fresh bath with the addition of

2—5% acetic acid or
5% acetate of ammonia (for very pale shades).

Enter the goods into the dyebath at 40-50°C. (105-120 deg. F.), raise within ½ hour to boiling point, and boil severely for 1½—2 hours. In the case of dark shades,

2—4% acetic acid (according to requirement)

are gradually added after one hour's boiling in order to exhaust the baths.

After dyeing, the goods are rinsed well, and finally well soured off with acetic or formic acid.

For any *subsequent slight shading* that may be found desirable, the following products are well suited:

Acid Yellow AT
Orange GG
Lanafuchsine SG
Azo Wool Blue C,

all of which may be added straight to the boiling bath. When shading, on the other hand, with Anthracene Colours, the bath must first be cooled off thoroughly, and, after adding the dyestuff, be brought again gradually to the boil.

Navies and Dark Blue.

The following dyestuffs are especially well suited for producing *navies and dark blues:*

Dark Blue WS
shaded if necessary with
Lanacyl Blue BB, R
Lanacyl Violet B

and for shades of particularly good resistance to light, alkalies and perspiration:

Anthracene Chrome Blue F
shaded if necessary with
Anthracene Chrome Violet B.

Method of Dyeing Dark Blue WS.

Method X.

Charge the dyebath with

10% acetate of ammonia,
5% acetic acid 30% and, say,
4—5% Dark Blue WS;

enter the goods into the bath at the boil, and exhaust after an hour's severe boiling by gradually adding 5—8% acetic acid. Thereupon rinse the goods, and finally sour off well with acetic or formic acid.

The products best adapted for shading subsequently are:

Azo Wool Blue C
Lanafuchsine SG
Azo Wool Violet 7R
Orange GG

which may be added straight away to the boiling liquor.

Method of Dyeing Anthracene Chrome Blue F.

Method XI.

Mordant the goods in the usual manner with

3—4% bichromate of potash and
1½—3% tartar

for 1½ hours at the boil, rinse, and dye in a fresh bath with about

3% Anthracene Chrome Blue F and
5% acetic acid.

Enter at about 70° C. (160 deg. F.), and raise to the boil in the course of 20 minutes; after boiling severely for one hour, add

5—7% acetic acid

in several portions, and allow to run for another ¾ to 1 hour in the strongly boiling bath. Finally rinse the goods well, and brighten.

For particulars of the subsequent shading see the remarks on page 36 relative to compound shades.

Blacks on Gentlemen's Suitings with Silk Effect Threads.

Anthracene Acid Black ST has proved of excellent service for the production of blacks; it leaves the silk effect threads a very clear white, so that if the dyeing is carried out properly, a subsequent cleaning of the silk is not necessary.

For bright blue-blacks a little Lanacyl Violet may be used for shading.

The fastness of the dyeings answers very exacting requirements in every respect.

Method XII.

Charge the dyebath, the volume of which should not exceed more than forty times the weight of the goods, with:

10 % cryst. Glauber's salt,
1¼ % formic acid and
8—9 % Anthracene Acid Black ST;

enter the goods at the boil, add after ¾ hour's severe boiling

1¼ % formic acid 85 %,

and run for another ¾ hour in a strongly boiling bath.

Thereupon rinse the material well in cold water, and enter it into a fresh boiling bath charged with

2½ % formic acid 85 % (of the weight of the goods);

after ½ hour's boiling add

2 % bichromate of potash,

and run for another ½ hour at the simmer.

Then rinse, and finally sour off well with formic acid.

Dyeing in a standing bath. The dyebath only partially exhausts and is therefore to advantage used over again for subsequent lots.

For every further lot, add to the standing bath

3 % cryst. Glauber's salt and
4½—5 % Anthracene Acid Black ST;

enter the goods into the boiling bath, and, after ¾ hour's severe boiling, add

1¼ % formic acid 85 %,

and dye for another ¾ hour in the strongly boiling bath.

Then rinse, and aftertreat as indicated for the first lot.

Stripping the Silk in Gentlemen's Suitings.

If not sufficiently clear in one case or another, the silk may be subjected to a subsequent cleaning; for this purpose a bath is prepared on a scale of 3 gallons acetate of ammonia to 1000 gallons, in which the goods are treated for 20 or 30 minutes. For dyeings produced with Anthracene Colours the stripping is done at the boil; for such produced with Dark Blue WS the temperature should be about 70—80°C. (160—175 deg. F.).

The goods are thereupon rinsed, and soured off with acetic or formic acid.

	Starting Bath	Dyed according to	Silk-dyed subsequently in a fresh bath, according to Method VIII, with:
1.	0,03 % Indian Yellow G	Method III	
2.	0,05 % Rosazeïne B		
3.	0,03 % Formyl Violet S4B 0,02 % Rosazeïne B		
4.	0,06 % China Yellow B 0,005 % Cyanole Fast Green G	Method I	
5.	0,05 % Rosazeïne B 0,04 % Acid Magenta 0,02 % Acid Violet 6BS		
6.	0,03 % Rosazeïne B 0,01 % Indian Yellow G		
7.	0,05 % Acid Violet 6BS		
8.	0,05 % Tetra Cyanole A 0,01 % China Yellow B		
9.	0,03 % Rosazeïne B 0,04 % Acid Magenta 0,05 % Orange R		
10.	0,15 % Indian Yellow G 0,15 % Tetra Cyanole V 0,05 % Azo Orseille BB		0,1 % Milling Yellow 0 0,05 % Tetra Cyanole V 0,3 % Azo Orseille BB

Acid Colours.

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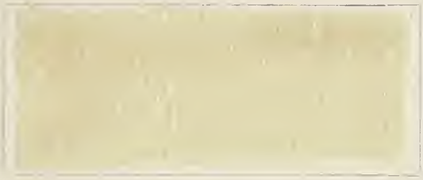

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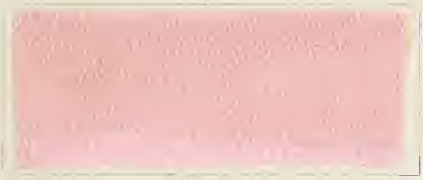

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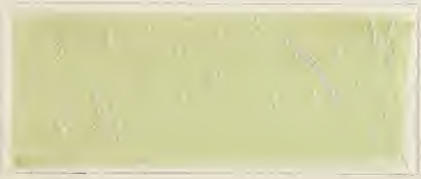

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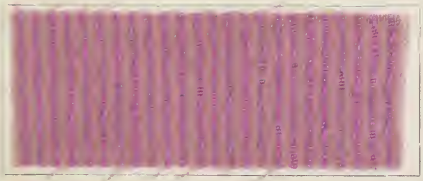

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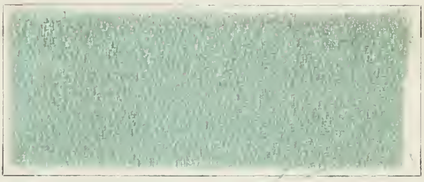

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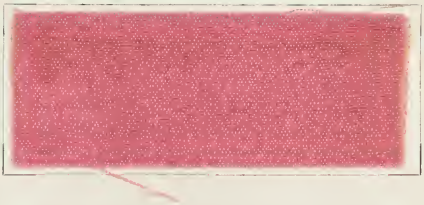

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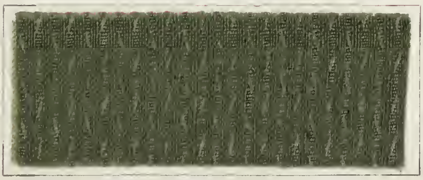

Starting Bath	Dyed according to	Silk-dyed subsequently in a fresh bath, according to Method VIII, with:
11. 0,4 % Indian Yellow G 0,15 % Azo Orseille BB 0,1 % Cyanole Fast Green G	Method I	0,1 % Milling Yellow 0 0,3 % Azo Orseille BB
12. 0,3 % Azo Orseille BB 0,1 % Indian Yellow G 0,05 % Tetra Cyanole V		0,6 % Azo Orseille BB 0,2 % Milling Yellow 0 0,05 % Acid Green extra conc.
13. 0,12 % Indian Yellow G 0,1 % Acid Violet 6BS 0,08 % Cyanole extra		
14. 3,5 % Brilliant Croceïne M		
15. 2,5 % Indian Yellow G 0,8 % Tetra Cyanole V 0,6 % Azo Orseille BB		0,3 % Milling Yellow 0 0,8 % Amaranth B 0,2 % Tetra Cyanole V
16. 0,1 % Azo Orseille BB 0,2 % Tetra Cyanole V		0,1 % Azo Orseille BB 0,05 % Tetra Cyanole V
17. 0,4 % Tetra Cyanole V 0,2 % Indian Yellow G 0,2 % Azo Orseille BB		0,3 % Amaranth B 0,2 % Milling Yellow 0 0,3 % Acid Green extra conc.
18. 0,25 % Orange EN 0,1 % Tetra Cyanole V		0,15 % Milling Yellow 0 0,3 % Lanafuchsine 6B
19. 0,7 % Cyanole FF 0,1 % Acid Violet 6BS		
20. 2 % Formyl Violet S4B 0,2 % Brilliant Milling Green B		

Acid Colours.

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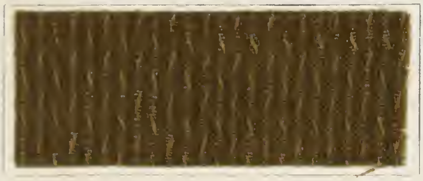

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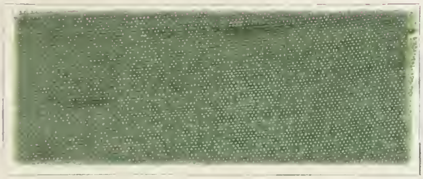

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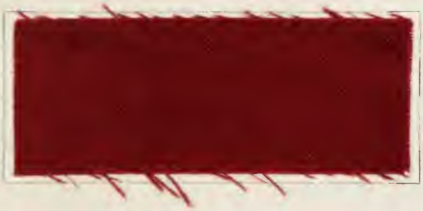

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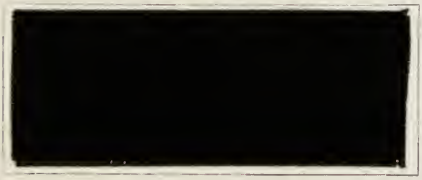

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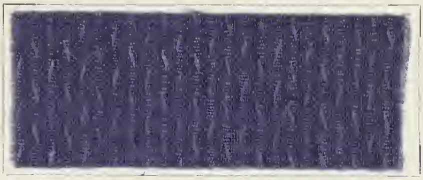

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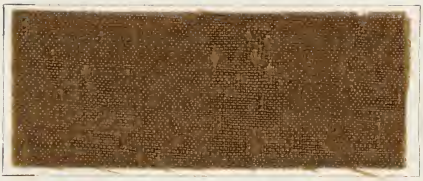

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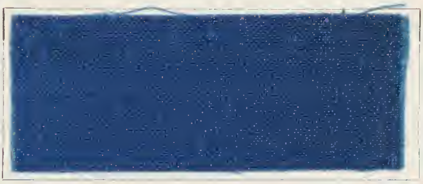

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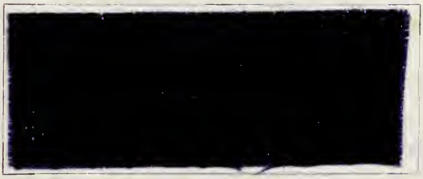

	Starting Bath	Dyed according to	Silk-dyed subsequently in a fresh bath, according to Method VIII, with:
21.	0,1 % Indian Yellow G 0,1 % Azo Orseille BB 0,5 % Tetra Cyanole V	Method I	0,1 % Milling Yellow 0 0,1 % Azo Orseille BB 0,08 % Tetra Cyanole V
22.	0,3 % Indian Yellow G 0,4 % Azo Orseille BB 0,2 % Tetra Cyanole V		0,25 % Tropaeoline RNP 0,4 % Milling Red FR 0,1 % Brilliant Milling Green B
23.	5 % Brilliant Croceïne 9B		
24.	1,2 % Indian Yellow R 2,8 % Brilliant Milling Green B 0,5 % Croceïne AZ		0,9 % Tropaeoline RNP 0,4 % Milling Red FR
25.	3,5 % Croceïne AZ 2 % Indian Yellow G 0,6 % Tetra Cyanole A		
26.	4,2 % Wool Blue TB 0,8 % Formyl Blue B		
27.	6,5 % Gloria Black B	Method II	
28.	6 % Naphtylamine Black 4B 0,3 % Brilliant Milling Green B	Method I	
29.	7,5 % Gloria Black II	Method II	
30.	6,5 % Neutral Wool Black B	Method I	

Acid Colours.

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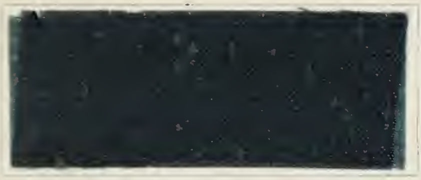

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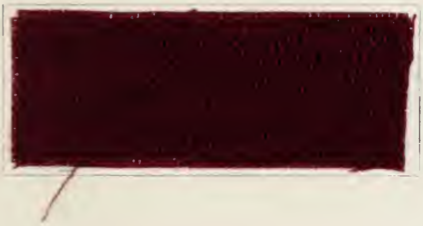

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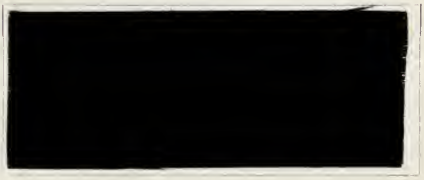

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Starting bath	Dyed according to
31. 0,1 % Diamine Fast Yellow FF	Method IV
32. 0,15 % Diamine Sky Blue FF	Method IV with 1% acetic acid
33. 0,5 % Diamine Rose GD 0,5 % Diamine Fast Yellow FF	Method IV
34. 3 % Oxy Diamine Blue 3R 0,5 % Oxy Diamine Blue 5G	
35. 3 % Diamine Bordeaux S 1 % Oxy Diamine Violet B	
36. 0,15 % Diamine Rose BD 0,05 % Diamine Rose GD	
37. 0,5 % Thioflavine S 0,2 % Oxy Diamine Blue 5G	
38. 3,5 % Diamine Catechine G 0,9 % Diamine Rose BD	
39. 2 % Diamine Yellow CP 0,3 % Diamine Orange B	
40. 4 % Diamine Dark Green N 1,2 % Oxy Diamine Blue 5G	

Diamine Colours

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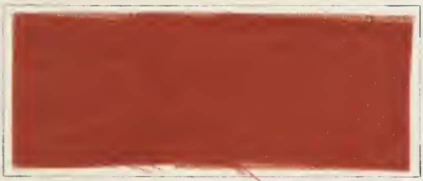

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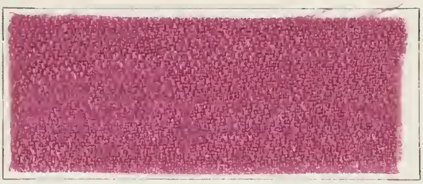

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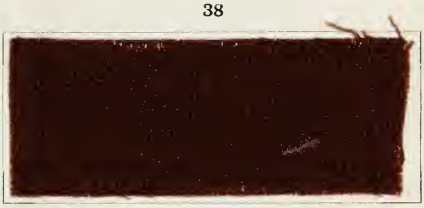

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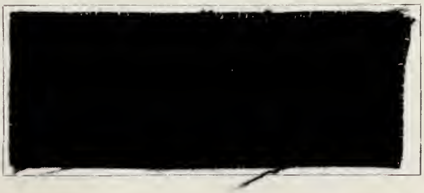

Starting bath	Dyed according to
41. 2,5 % Diamine Scarlet B 0,5 % Diamine Orange F	Method IV
42. 3 % Oxy Diamine Blue 3G	
43. 1,5 % Diamine Fast Yellow FF 2 % Diamine Catechine G	
44. 2 % Diamine Green CL 2,5 % Thioflavine S	
45. 4,5 % Diamine Brown V 0,5 % Diamine Brown 3G	
46. 0,4 % Thioflavine S 0,6 % Oxy Diamine Blue 5G	
47. 2,5 % Diamine Yellow CP 0,5 % Diamine Brown 3G	
48. 3 % Diamine Scarlet B 1,5 % Diamine Bordeaux S	
49. 1,5 % Oxy Diamine Blue 5G 2 % Oxy Diamine Blue R	
50. 7 % Oxy Diamine Black JW	

Diamine Colours.

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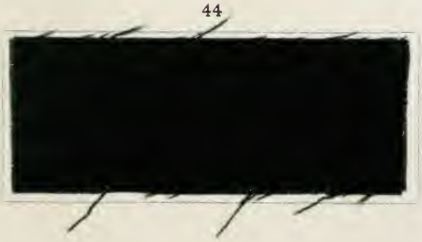

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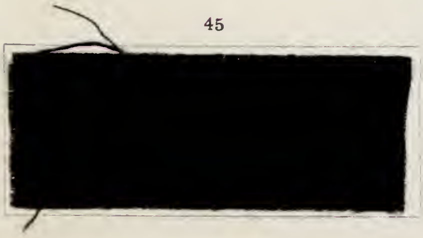

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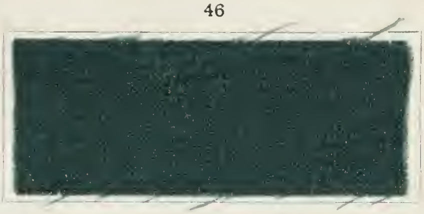

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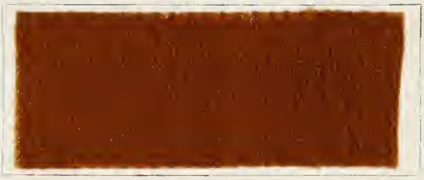

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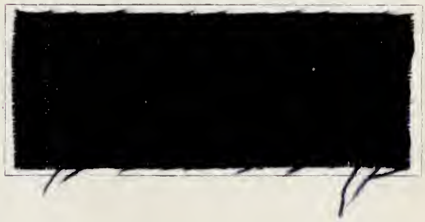

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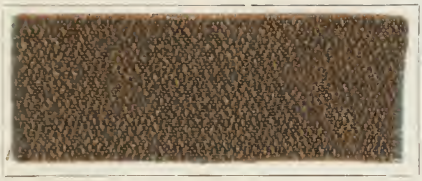
	Wool-dyed with	According to Method	Stripped with:	Silk-dyed subsequently in a fresh bath, according to Method VIII, with:
51.	0,2 % Cyanole FF 0,05 % Lanafuchsine SG	V	hot water	0,3 % Indian Yellow G 0,3 % Amaranth B
52.	0,8 % Cyanole FF 1 % Orange GG			2 % Milling Red FR 0,5 % Tropaeoline RNP
53.	1,5 % Acid Yellow AT 0,3 % Lanafuchsine SG 0,1 % Cyanole FF			1 % New Methylene Blue N 0,2 % Safranine G extra No. 0
54.	3 % Brilliant Scarlet 4R			2 % Acid Green extra conc.
55.	0,8 % Cyanole FF 0,3 % Acid Yellow AT 0,05 % Lanafuchsine SG		hot water	0,5 % Rosazeïne B
56.	1,5 % Orange GG 0,5 % Acid Yellow AT			2,5 % Indigo Blue N
57.	0,8 % Lanafuchsine SG 0,3 % Orange GG 0,2 % Azo Wool Blue C		hot water	2,5 % Brilliant Milling Green B
58.	7 % Naphtylamine Black EFF	VII		1,5 % Para Phosphine G
59.	7 % Naphtylamine Black EFF		Hydrosulphite	Silk blued with a trace of Water Blue B
60.	8 % Naphtylamine Black EFF		Hydrosulphite	3 % Brilliant Croceïne M

Two-coloured Effects.

51



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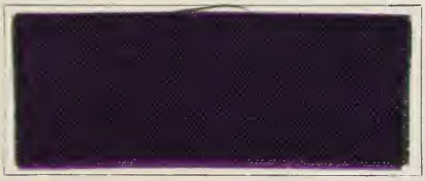

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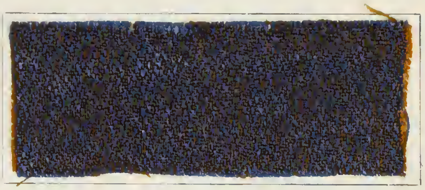

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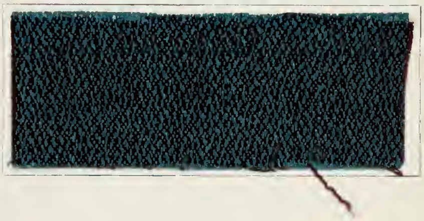

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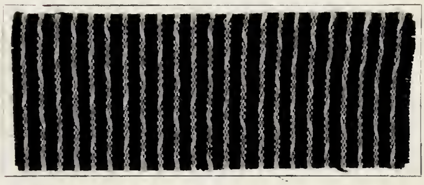

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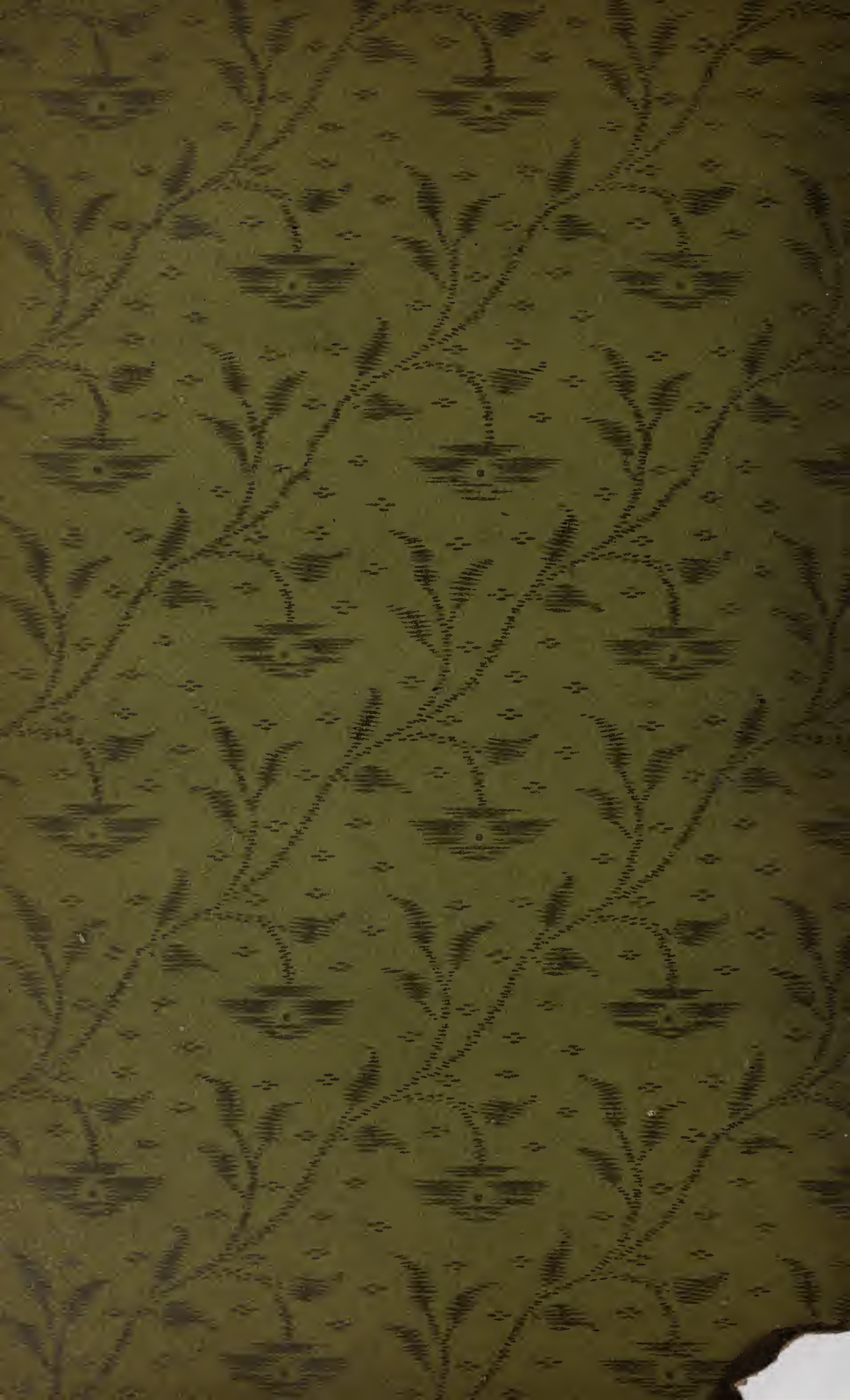

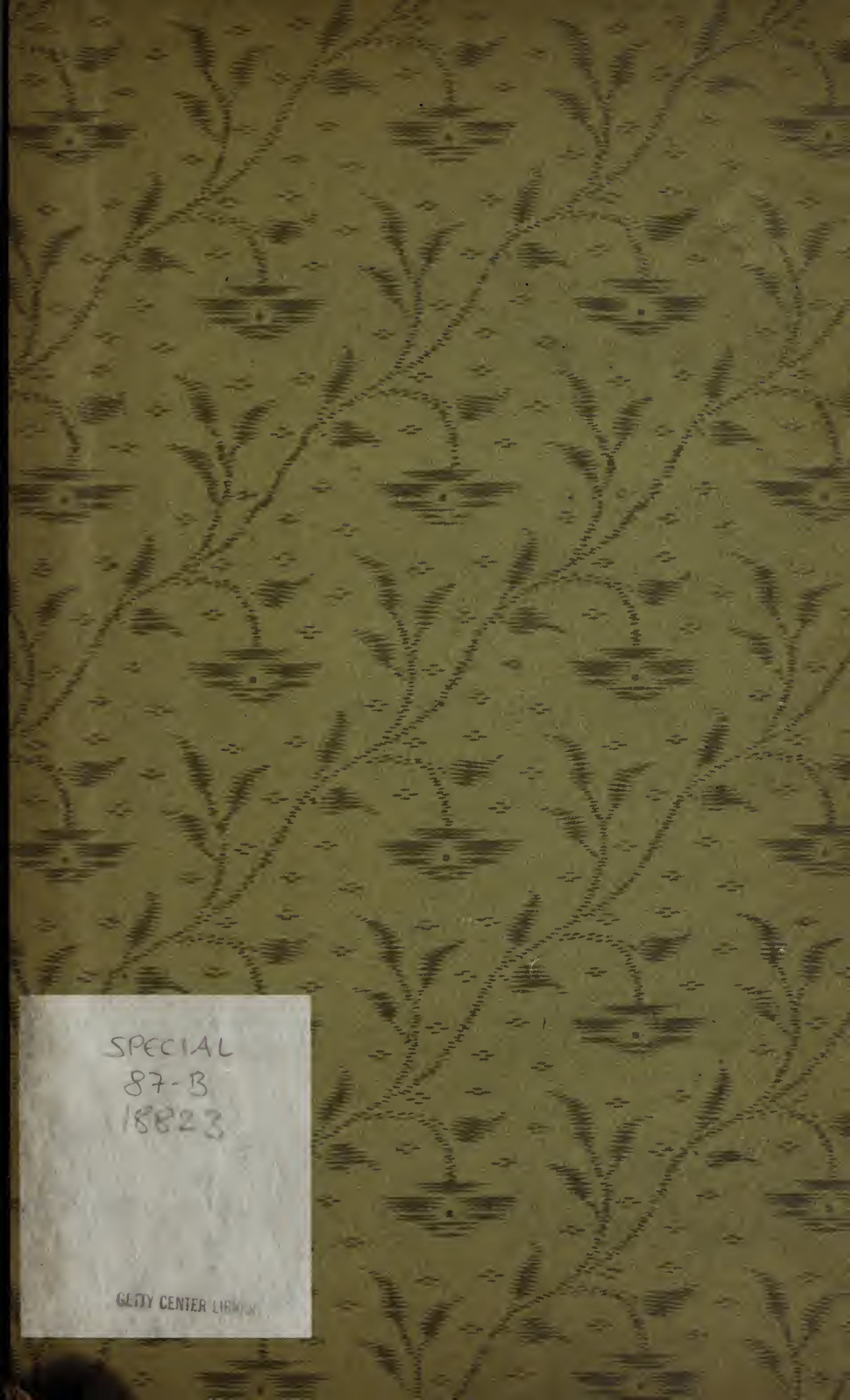

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